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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/726,724

Applicant(s)

HANSON ET AL.

Examiner

JOHN M. FRINK

Art Unit

2142

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 6 and 8 - 51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 6 and 8 - 51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/10/2008 have been fully considered but they are not persuasive.
2. Applicant argues that "There is nothing in the Kennedy patent publication that corresponds to the claimed subject matter of the establishment of the plurality of topology criterions, obtaining the current status of the system topology and then making a recommendation to at least one of the agents based on the obtained information to modify its topology". However, Kennedy shows said claimed "establishment of the plurality of topology criterions" through the disclosure of criterions such as node density, quality of service, stability, number of paths required, etc. ([32, 38-40, 45-47, 93-101]). The claimed "obtaining the current status of the system topology" is shown through "route discovery", disclosed in [25, 39-42, 47]. Kennedy also teaches "making a recommendation to at least one of the agents based on the obtained information to modify its topology" in [90-109, 223] and Figs. 3 - 6, which shows, for example, requesting discovery of new routes (which results in the modification of the topology) based on stability requirements, observed node density, observed quality of service, etc. Thus for at least the reasons given above, Applicant's arguments are not persuasive.
3. Applicant next argues that Kennedy is different from Applicant's claimed invention in that "in such a system the relationships among software agents are of arbitrary nature and in which the agents provide arbitrary services to one another."

However, Applicant's argument is not related to claimed subject matter. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

4. Applicant also argues that "Unlike Kennedy, the current invention is not addressed to "repairing the network", but to "modifying the topology". However, Kennedy's alleged "repairing the network" results in topology modifications, and thus Applicant's arguments are not persuasive.

5. Applicant next argues "the present invention can be used to cause agents to reevaluate possible service-providers and elect to change to a "better" service provider"; however, said features are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

6. Finally, regarding claims 9 and 10, Applicant argues that Bettstetter "deals solely with communications networks, and solely with the issue of maintaining global connectivity across the network". However, Applicant's arguments do not relate to what Bettstetter was cited to teach. Furthermore, claims 9 and 10 were rejected under 35 USC 103, Kennedy in view of Swiler, Bettstetter, and for claim 10, in view of Brandt. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA

1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's arguments relating to Bettstetter thus are not persuasive.

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter for the reasons given below in the 35 USC 112 written description rejection. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 5, 6, 23, 42, 47, 48, 50 and 51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. Claims 1 refers to "establishing a topology to address each of a plurality of system topology criterions" and claim 42 to "establishing a topology to address each one of a plurality of different criterions" i.e., establishing multiple topologies. However, support for establishing a multiple topologies is not provided in Applicant's specification; said specification merely supports "establishing a topology".

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5. Claims 1 and 42, as well as claims 5, 6, 23, 47, 48 and 51 each refer to where multiple criteria have been established. However, support for having established multiple criteria was not provided in Applicant's originally filed specification.

6. Claim 5 also refers to "approaching" one of the plurality of established criteria; support for "approaching" one of the plurality of established criteria is not disclosed in Applicant's originally filed specification.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-46 and 47-51 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As to claims 23-41, they are directed solely to software (i.e., the topology tuner *software* agent). Software alone is not patentable unless it is embodied on a computer readable medium. As to claims 42-46 and 47-51, they are nominally directed to a data processing system, yet the only structural elements claimed as part of the system is a plurality of self-organizing *software* agents, data, and a topology tuning function. It appears it is a misnomer to say these claims are directed to an apparatus or machine when they claim only software. Software alone is not patentable unless it is embodied on a computer readable medium.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

8. Claims 1, 5, 15, 21, 23, 24, 26, 40, 42, 43, 47, 50 and 51 are rejected under 35 U.S.C. 102(a) as being anticipated by Kennedy et al. (US 2004/0218582 A1), hereafter Kennedy.

9. Regarding claim 1, Kennedy shows in a data processing system (Abstract), a method to tune a topology of relationships between a plurality of self-organizing software agents, comprising establishing a topology to address each of a plurality of system topology criterions ([32, 38-40, 45-47, 93-101], criteria including node density, quality of service, stability, number of paths required)

obtaining information including inter-agent relationship in a manner that is descriptive of the system topology (Fig. 3, [39-40, 42, 51, 114-115]) and

based at least in part on the obtained information and making at least one recommendation to at least one of the plurality of agents that is intended to modify the topology ([223] showing requesting discovery of new routes, which changes the topology) of the at least one of the plurality of agents to more closely match the topology of a selected one of the plurality of established topology criterions ([33-38, 51, 45-57, 90-109, 115]).

10. Regarding claim 5, Kennedy shows where the step of obtaining information is performed on a periodic basis by said topology tuner agent to update the state of the topology ([0141-0144, 0146-0158, 0166-0167]), and where the topology tuner agent makes the at least one recommendation when a topology threshold condition

approaching one of the plurality of established criteria is satisfied (0187, 01910196, 0203, 0211, 0215, 0228).

11. Regarding claim 15, Kennedy shows where making at least one recommendation is performed by a topology tuner agent using a multi-cast technique to simultaneously contact a number of the agents ([0034,0038,0217,0221]).

12. Regarding claim 21, Kennedy shows where obtaining information and making at least one recommendation are performed by an entity ([0033-0038,0044-0047]) in an environment ([0024]) that hosts the plurality of agents (Fig. 1).

13. Regarding claim 23, Kennedy shows a topology tuner software agent operable in a data processing system that comprises a plurality of self-organizing software agents (Abstract, Figs. 1 and 3, [1-4]),

comprising computer program code for establishing a plurality of system topology criteria ([32, 38-40, 45-47, 93-101])

comprising computer program code for obtaining information that is descriptive of a topology of relationships between the self-organizing software agents from at least one of a system registry function and from the self-organizing software agents themselves ([21, 39-42, 51]); and

computer program code, responsive to the obtained information and for making at least one recommendation to at least one of the plurality of self-organizing software agents that is intended to modify the topology closer to the topology corresponding to a selected one of the plurality of established criteria ([33-38, 51, 45-47, 90-109,115]).

14. Regarding claim 24, Kennedy shows where obtaining information is performed on a periodic basis by said topology tuner agent to update the state of the topology ([0141-0144, 0146-0158, 0166-0167]), and where the topology tuner agent makes the at least one recommendation when some topology threshold condition is satisfied (0187, 01910196, 0203, 0211, 0215, 0228)).

15. Regarding claim 26, Kennedy shows where the established criterion comprises a vulnerability of the topology to a failure of one or more of the agents ([0216, 0217, 0225]).

16. Regarding claim 40, Kennedy further shows where said computer program code is stored on a computer readable medium ([0021]).

17. Regarding claim 42, Kennedy shows a data processing system comprising a plurality of self-organizing software agents configurable for autonomously establishing relationships between themselves (Abstract, [0001-0004]), where the totality of the relationships can be represented by a topological structure having nodes that each comprise one of the plurality of software agents and links between the nodes that comprise the established relationships ([0141-0144, 0146 – 0158, 0166-0167]),

data establishing a topology to address each one of a plurality of different criterions ([38-40,45-47, 93-101], criterion including, for example, quality of service, node density, stability, etc.);

a topology tuning function that obtains information that is descriptive of the topology including inter-agent relationships and, based at least in part on the obtained information and on the data of the topology, that makes a recommendation to at least

one of the plurality of software agents that is intended to modify the topology of a selected one of the plurality of established criterions ([0033-00368,0045-0048]).

18. Regarding claim 43, Kennedy shows where topology tuning function is performed by a topology tuner software agent (Abstract, Figs. 1 and 3, [0021, 0033-0038, 0045-0047]).

19. Regarding claim 47, Kennedy shows wherein the step of obtaining information comprises determining to which one of the plurality of established criterions that the current system topology most closely responds ([29, 100, 130 – 166]).

20. Regarding claim 50, Kennedy shows wherein the step of obtaining the current information comprises forming a histogram of the inter-relationships of the plurality of agents ([41, 42, 106]).

21. Regarding claim 51, Kennedy shows wherein the information is obtained and compared to at least one of the plurality of established criterions ([32, 38-40, 90 – 109]).

22. Claims 2, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Assa (US 2004/0059812 A1).

23. Regarding claim 2, Kennedy shows claim 1.

Kennedy does not show where the step of obtaining information is performed by a topology tuner agent by querying a system registry to determine identities of individual ones of the plurality of agents.

Assa shows where the step of obtaining information is performed by a topology tuner agent that by querying a system registry to determine identities of individual ones of the plurality of agents ([0061-0066,0078-0079,0090]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Assa in order to utilize an improved topology information system (Assa, Abstract).

24. Regarding claim 3, Kennedy in view of Assa further show where the step of obtaining information is performed by a topology tuner agent by querying individual ones of the plurality of agents to determine to which other agent or agents the individual one of the plurality of agents currently has a relationship (Assa, [0082,0092-0096,0202-0203]).

25. Regarding claim 4, Kennedy in view of Assa further show where the step of obtaining information is performed by a topology tuner agent by querying a system registry to determine to which other agent or agents that individual ones of the plurality of agents currently have a relationship (Assa, Figs. 3 – 5, [0061-0066,0078-0079,0090]).

26. Claim is 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Swiler et al. (US 7,013,395 B1), hereafter Swiler.

27. Regarding claims 6 and 48, Kennedy shows claims 1 and 47, including where a criterion comprises a vulnerability of the topology to a failure of one or more of the agents ([216, 217, 225]).

Kennedy does not show where a criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents.

Swiler shows where the at least one criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (col. 3 lines 10 – 15, col.3

lines 25 – 33).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Swiler in order to provide for a method of assessing security attributes system vulnerabilities (Swiler, Abstract), which are important attributes in keeping a network operationally stable.

28. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Swiler et al. (US 7,013,395 B1), hereafter Swiler.

Regarding claim 25, Kennedy shows claim 23.

Kennedy does not show where the at least one criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents

Swiler shows where the at least one criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (col. 3 lines 10 – 15, col.3 lines 25 – 33).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Swiler in order to provide for a method of assessing security attributes system vulnerabilities (Swiler, Abstract), which are important attributes in keeping a network operationally stable.

29. Claims 9, 10, 28, 29 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Swiler et al. (US 7,013,395 B1), hereafter Swiler, further in view of Bettstetter (On the Minimum Node Degree and Connectivity of a Wireless Multihop Network).

Regarding claims 9 and 28, Kennedy shows claim 1.

Kennedy does not show where at least one established criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents.

Swiler shows where the at least one established criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (Swiler, col. 3 lines 10 – 15, col.3 lines 25 – 33).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Swiler in order to provide for a method of assessing security attributes system vulnerabilities (Swiler, Abstract), which are important attributes in keeping a network operationally stable.

Kennedy focuses on discovering new routes and discovering new agents, along with making recommendations to improve the network, but makes no mention of constraining new agents with which relationships can be formed. Swiler, as noted above, does address system vulnerabilities, but not constraining new relationship choices.

Given that there are only two possible methods for agents to behave regarding how to manage new relationships, it would have been obvious to one of ordinary skill in the art at the time of the invention try both choices, thus enabling choosing either limiting relationship choices or not limiting relationship choices.

Therefore, Kennedy in view of Swiler disclose where the at least one recommendation does not constrain the set of potential agents that an agent may select from to form a new relationship or relationships.

Kennedy in view of Swiler do not show where the topology then evolves towards a Gaussian type distribution.

Bettstetter shows evolving toward a Gaussian type distribution (Abstract, pg. 81, col. 2 P2) and discloses that a Gaussian/uniform random distribution is desirable to avoid isolated nodes and to have a connected and thus reliable network (pg. 81, col.2 P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler with that Bettstetter to help ensure the creation of an optimal topology (Bettstetter, Abstract).

30. Regarding claims 10 and 29, Kennedy in view of Swiler further show where at least one established criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (Swiler, col. 3 lines 10 – 15, col.3 lines 25 – 33).

Kennedy focuses on discovering new routes and discovering new agents, along with making recommendations to improve the network, but makes no mention of constraining new agents with which relationships can be formed. Swiler, as noted above, does address system vulnerabilities, but not constraining new relationship choices.

Given that there are only two possible methods for agents to behave regarding how to manage new relationships, it would have been obvious to one of ordinary skill in the art at the time of the invention try both choices, thus enabling choosing either limiting relationship choices or not limiting relationship choices.

Therefore, Kennedy in view of Swiler disclose where the at least one recommendation does constrain the set of potential agents that an agent may select from to form a new relationship or relationships.

Kennedy in view of Swiler do not show where the topology then evolves towards a Gaussian type distribution.

Bettstetter shows evolving toward a Gaussian type distribution (Abstract, pg. 81, col. 2 P2) and discloses that a Gaussian/uniform random distribution is desirable to avoid isolated nodes and to have a connected and thus reliable network (pg. 81, col.2 P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler with that Bettstetter to help ensure the creation of an optimal topology (Bettstetter, Abstract).

31. Regarding claim 45, Kennedy in view of Swiler further show where an established criterion comprises a vulnerability of the topology to an attack directed to one or more of the software agents.

Kennedy focuses on discovering new routes and discovering new agents, along with making recommendations to improve the network, but makes no mention of constraining new agents with which relationships can be formed. Swiler, as noted above, does address system vulnerabilities, but not constraining new relationship choices.

Given that there are only two possible methods for agents to behave regarding how to manage new relationships, it would have been obvious to one of ordinary skill in

the art at the time of the invention try both choices, thus enabling choosing either limiting relationship choices or not limiting relationship choices.

Therefore, Kennedy in view of Swiller disclose where the at least one recommendation does not constrain the set of potential agents that an agent may select from to form a new relationship or relationships, and Kennedy in view of Swiller disclose where the at least one recommendation does constrain the set of potential agents that an agent may select from to form a new relationship or relationships. It is inherent that if the number of relationships with which an agent may form a new relationship is limited that such an agent will have comparatively few relationships.

Kennedy in view of Swiler do not show where the topology then evolves towards a Gaussian type distribution.

Bettstetter shows evolving toward a Gaussian type distribution (Abstract, pg. 81, col. 2 P2) and discloses that a Gaussian/uniform random distribution is desirable to avoid isolated nodes and to have a connected and thus reliable network (pg. 81, col.2 P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler with that Bettstetter to help ensure the creation of an optimal topology (Bettstetter, Abstract).

32. Claims 10, 29 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Swiler and Bettstetter, as applied to claims 9 and 28 above, further in view of Brandt et al. (US 2004/0117624 A1), hereafter Brandt.

33. Regarding claims 10 and 29, Kennedy in view of Swiler and Bettstetter further show where an established criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (Swiler, col. 3 lines 10 – 15, col.3 lines 25 – 33).

Kennedy in view of Swiler and Bettstetter also disclose performing the above aspects of claim 45 such that the topology evolves towards a uniform random graph (Bettstetter, pg. 81, col.2 P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

Kennedy in view of Swiler and Bettstetter do not explicitly show constraining the set of potential agents that an agent may select from.

Brandt shows removing suspicious computers from the network ([0047]), thus disclosing constraining the set of potential agents that an agent may select from.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler and Bettstetter with that of Brandt in order to provide additional advanced methods for performing network security checks (Brandt, Abstract).

34. Regarding claim 45, Kennedy in view of Swiler, Bettstetter and Brandt further show where an established criterion comprises a vulnerability of the topology to an attack directed to one or more of the software agents (Swiler, col. 3 lines 10 – 15, col.3 lines 25 – 33).

Kennedy in view of Swiler and Bettstetter also disclose performing the above aspects of claim 45 such that the topology evolves towards a uniform random graph

(Bettstetter, pg. 81, col.2 P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

Kennedy in view of Swiler, Bettstetter and Brandt further disclose removing suspicious computers from the network ([0047]), thus disclosing constraining the set of potential agents that an agent may select from (Brandt, [0047]).

Therefore, Kennedy in view of Swiler, Bettstetter and Brandt disclose where the at least one recommendation does constrain the set of potential agents that an agent may select from to form a new relationship or relationships. It is inherent that if the number of relationships with which an agent may form a new relationship is limited that such an agent will have comparatively few relationships.

Given that there are only two possible methods for agents to behave regarding how to manage new relationships, it would have been obvious to one of ordinary skill in the art at the time of the invention try both choices, thus enabling choosing either limiting relationship choices or not limiting relationship choices.

35. Claims 8, 20, 27, 38 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Stanforth et al. (US 2004/0081166 A1), hereafter Stanforth.

36. Regarding claims 8, 27 and 44, Kennedy discloses claim 1, 23 and 42.

Kennedy does not disclose where the an established criterion comprises a rate at which agents form new relationships.

Stanforth shows where an established comprises a rate at which agents form new relationships (Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Stanforth in order to increase the level of control over the agents in the network, specifically the forming of relationships (Stanforth, Abstract).

37. Regarding claims 20 and 38, Kennedy in view of Stanforth further show where obtaining information and making at least one recommendation are performed by a topology tuner agent that monitors how frequently individual ones of the agents change their relationships, said topology tuner agent querying (Kennedy [188-203]) those agents more frequently that more frequently change their relationships (specifically shown by Stanforth through showing changing the update rate based on relationship changes to save bandwidth and power ([6-9, 15])).

38. Claims 11, 30 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Brandt and Albert et al. (Error and attack tolerance of complex networks), hereafter Albert.

Kennedy shows claim 1, including where at least one established criterion comprises a vulnerability of the topology to a failure of one or more of the agents ([216,217,225]).

Kennedy does not show where the at least one recommendation constrains the set of potential agents that an agent may select from to form a new relationship or relationship such that the topology evolves towards a scale-free network.

Brandt shows where the at least one recommendation constrains the set of potential agents that an agent may select from to form a new relationship or relationships ([47]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Brandt in order to provide additional advanced methods for performing network security checks (Brandt, Abstract).

Kennedy in view of Brandt do not show where, after set of potential agents that an agent may select from to form a new relationship or relationships is constrained, performing said constraining such that the topology evolves towards a scale-free network.

Albert shows where when connection choices are limited (which Brandt's recommendation constrains the set of potential agents that an agent may select from inherently results in doing), networks evolve to become highly connected and thus scale-free (pg. 379, col. 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Brandt with that of Albert in order to provide a better understanding for how limiting network choices will effect a networks characteristics.

39. Claims 12, 13, 14, 31, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Habetha (US 7,031,321 B2).

40. Regarding claims 12 and 31, Kennedy shows claims 1 and 23, including monitoring topology and the need for reconfiguration of topology due to node movement

((0004)) and to adapt to other changes ((0006)), thus showing monitoring the drift or re-self-organization of the topology.

Kennedy does not explicitly show where the at least one recommendation is made to compensate for the drift that has occurred over time.

Habetha shows periodically checking the actual network state to monitor for changes during operation, and updating the topology based on these changes (col. 1 line 15 – col. 2 line 35), thus showing monitoring over time and making at least one recommendation to compensate for changes over time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Habetha in order to provide for an improved method of monitoring a dynamic network and ensuring that network state records reflect actual network conditions (Habetha, Abstract).

Kennedy in view of Habetha thus show obtaining information comprises monitoring the drift or re-self-organization of the topology over time, and where the at least one recommendation is made to compensate for the drift.

41. Regarding claims 13 and 32, Kennedy in view of Habetha further show where obtaining information and making at least one recommendation are performed by a topology tuner agent that is recognized by the plurality of agents to have privileges giving it sufficient nominal authority to make its recommendations to the other agents effective, specifically where Kennedy shows a distributed system that tunes topology ((0004-0006,0039-0042,0051)), and Habetha shows using centralized controllers making network management decisions networks (Fig. 2, col. 1 lines 15 – 43, col. 2

lines 63 – 67, col. 3 lines 48 – 64). It is inherent that a central controller, as shown by Habetha, have privileges giving it sufficient nominal authority to make its recommendations to the other agents effective, as otherwise it would be inoperable due to its inability to control anything.

Kennedy in view of Habetha thus show where obtaining information and making at least one recommendation are performed by a topology tuner agent that is recognized by the plurality of agents to have privileges giving it sufficient nominal authority to make its recommendations to the other agents effective.

42. Regarding claims 14 and 33, Kennedy in view of Habetha further show where said topology tuner agent behaves otherwise as a peer agent that uses the same system messaging infrastructure as the other agents (Kennedy, Figs. 1 and 2, [0026-0031,0033-0034,0166,0170,0172], specifically showing route maintenance/updating (topology tuning) taking place in normal peer agents, thus showing each peer agent also representing said topology tuner).

43. Claims 16 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Liu et al. (US 7,184,421 B1), hereafter Liu.

Kennedy shows claims 1 and 23, including where making at least one recommendation is performed by a topology tuner agent (Kennedy, Figs. 1 and 2, [0026-0031,0033-0034,0166,0170,0172]).

Kennedy does not show using a single-cast technique to individually contact the agents.

Liu shows using a single-cast technique to individually contact the agents (Abstract, col. 1 lines 30 – 35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Liu in order to utilize an old and well known method of efficiently routing information directly between two computers.

44. Claims 17 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Goldman et al. (US 2003/0046583), hereafter Goldman.

Kennedy shows claims 1 and 23, including where obtaining gathers information concerning all relationships ([0141-0164]), and making at least one recommendation ([0033-0038, 0045-0047]).

Kennedy does not show where said at least one recommendation applies to all types of relationships between agents.

Goldman shows where at least one recommendation applies to all types of relationships between agents ([0032], specifically showing applying recommendations to allow or prohibit services to users both inside and outside of the network, which comprises all types of relationships).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Goldman in order to apply security goals across all areas of a network, improving the goal of maintaining network security (Goldman, Abstract).

45. Claims 18, 19, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Cain (US 6,697,325 B1).

46. Regarding claims 18 and 36, Kennedy shows claims 1 and 23.

Kennedy does not show where obtaining information gathers information concerning relationships of a certain type or types, and where the at least one recommendation applies only to the certain type or types of relationships between agents.

Cain shows where obtaining information gathers information concerning relationships of a certain type or types (Fig. 2; where the type is relationships between active and failed links), and where the at least one recommendation applies only to the certain type or types of relationships between agents (Fig. 2; recommending only nodes/agents involved with the failed link update their topology database).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Cain in order to minimize the overhead inherently involved in monitoring network traffic by minimizing the sources from which information is gathered and the sources to which recommendations are made.

47. Regarding claims 19 and 37, Kennedy in view of Cain further show where obtaining information and making at least one recommendation are performed in response to a notification of a change in the topology (Cain, Fig. 2, specifically showing where said recommendation is only performed after being informed of a link failure (which comprises said topology change)).

48. Claims 22 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Hanzlik et al. (US 2004/0044891 A1), hereafter Hanzlik.

Kennedy shows claims 1 and 23, including making at least one recommendation ([0033-0047]).

Kennedy does not show where the plurality of agents operate with a common set of system policies that are capable of being changed by a policy update procedure, and where making at least one recommendation is performed during a policy update procedure.

Hanzlik shows where the plurality of agents operate with a common set of system policies (Figs. 1A and 8A, [0030]) that are capable of being changed by a policy update procedure ([0048-0050]), and performing multiple tasks during a policy update procedure ([0048-0051]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Hanzlik in order to provide for a method maintaining a common set of network behavior, to, among other goals, help maintain system security and coherency (Hanzlik, Abstract).

Kennedy in view of Hanzlik thus show giving network recommendations (Kennedy [0033-0047]) and policy updates, where said policy updates can comprise multiple items sent during one update (Hanzlik [0048-0051]). It would have thus been obvious to one of ordinary skill in the art at the time of the invention that on of the multiple items sent during a policy update could be a recommendation, as minimizing the number of transmissions would have the obvious effect of improving network

performance, as well as being an old and well known method in the art of optimizing network traffic.

49. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view Ikeda et al. (5,091,920), hereafter Ikeda.

Kennedy shows claims 23 and 24, including a threshold condition ([0211, 0215])

Kennedy does not show where said threshold condition is expressed as a variable threshold value.

Ikeda shows expressing a threshold condition is expressed as a variable threshold value (Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy with that of Ikeda in order to utilize an method of making accurate comparisons (Ikeda, Abstract).

50. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Swiler as applied to claim 48 above, further in view of Bettstetter and Albert.

Kennedy in view of Swiler show claim 48, including where an established criterion comprises a vulnerability of the topology to an attack directed to one or more of the agents (Swiler, col. 3 lines 10 – 15, col.3 lines 25 – 33).

Kennedy in view of Swiler do not show where the established criterion of vulnerability of the topology to attack evolves toward a Gaussian type distribution.

Bettstetter shows evolving toward a Gaussian type distribution (Abstract, pg. 81, col. 2 P2) and discloses that a Gaussian/uniform random distribution is desirable to avoid isolated nodes and to have a connected and thus reliable network (pg. 81, col.2

P2; pg. 82 col. 1 Section 4.1; pg. 83 col. 2 Section 4.2; Section 5.1; Section 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler with that Bettstetter to help ensure the creation of an optimal topology (Bettstetter, Abstract).

Kennedy in view of Swiler and Bettstetter show where an established criterion comprises a vulnerability of the topology to a failure of one or more of the agents ([0216, 0217, 0225]), but do not show where it evolves toward a scale free distribution.

Albert shows a scale free distribution, and where a scale free distribution is associated with a high degree of error tolerance and robustness (pg. 378 col. 2 and pg. 379 col. 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kennedy in view of Swiler and Bettstetter with that of Albert, and improve the degree of connectivity within the network (shown as a property of scale-free networks; Albert, pg. 379, col. 1) such that the network evolves to become scale free, in order to improve the networks error tolerance and robustness in order to avoid vulnerability to network failure.

Conclusion

51. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Piedad et al.; US 6,882,627 B2
- b. Apostolopoulos et al.; US 2005/0080894 A1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M. Frink whose telephone number is (571) 272-9686. The examiner can normally be reached on M-F 7:30AM - 5:00PM EST; off alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571) 272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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